

**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF MASSACHUSETTS**

NUANCE COMMUNICATIONS, INC.,

Plaintiff,

v.

OMILIA NATURAL LANGUAGE  
SOLUTIONS, LTD.,

Defendant.

Case No.

**JURY TRIAL DEMANDED**

**COMPLAINT FOR PATENT INFRINGEMENT**

Plaintiff Nuance Communications, Inc. (“Nuance” or “Plaintiff”) files this Complaint for patent infringement against Defendant Omilia Natural Language Solutions, Ltd. (“Omilia” or “Defendant”), and alleges as follows:

**NATURE OF THE ACTION**

1. This is an action for patent infringement of United States Patent Nos. 7,505,905 (“the ’905 Patent”), 8,532,993 (“the ’993 Patent”), 8,027,839 (“the ’839 Patent”), 8,521,534 (“the ’534 Patent”), 8,379,804 (“the ’804 Patent”), 8,909,532 (“the ’532 Patent”), 7,149,688 (“the ’688 Patent”), and 6,999,925 (“the ’925 Patent”) (collectively, the “Asserted Patents”) under the United States Patent Laws, 35 U.S.C. § 1 *et seq.* Nuance is a leading designer and provider of innovative Automated Speech Recognition (ASR) and transcription technologies for businesses around the world. Nuance’s Conversational Interactive Voice Response (IVR) systems and related technologies are used by many leading call centers, in multiple languages, around the world. Nuance owns patents covering these ASR, IVR, and translation technologies, including the Asserted Patents.

2. Nuance brings this action because Omilia chose to infringe Nuance's valuable intellectual property instead of expending time and resources to create and develop its own technology. Omilia's infringing conduct is no accident; it first learned of Nuance's innovation in interactive voice response and speech recognition technologies long ago, when it licensed certain of Nuance's speech verification and recognition software products overseas for use in Omilia's systems outside the United States. That relationship ended years ago, yet Omilia continues to use Nuance technology, and Omilia has simply opted to infringe Nuance's patents, rather than attempt to compete legitimately in the market using its own research and development. More recently, with Omilia's expansion into North America, Omilia has begun infringing Nuance's United States patents. Nuance seeks to recover damages for Omilia's wrongful conduct and to stop Omilia's continuing willful infringement.

### **PARTIES**

3. Nuance is a corporation formed under the laws of Delaware and has a principal place of business at 1 Wayside Road, Burlington, Massachusetts. Nuance is a global leader in developing and providing innovative interactive voice response and speech recognition technologies for business and individuals. A wide variety of industries rely on Nuance's advanced solutions to power and enhance interactions with customers and improve user experiences, including financial services, healthcare, telecommunications, retail, travel, utilities, government, and insurance. Nuance owns patents covering these technologies, including the Asserted Patents.

4. Upon information and belief, Omilia is a foreign entity formed under the laws of the country of Greece with a principal place of business in the country of Cyprus at Gladstonos 55, Roussos Center Point, Office 3C-3D, 3040 Limassol.

### **JURISDICTION AND VENUE**

5. This is an action for patent infringement arising under the patent laws of the United States, 35 U.S.C. § 1 *et seq.* This Court has subject matter jurisdiction over this action under at least 28 U.S.C. §§ 1331 and 1338(a).

6. This Court has personal jurisdiction over Omilia because, upon information and belief, Omilia operates or has operated a place of business in this State, located at 51 Melcher Street, 1<sup>st</sup> Floor, Boston, MA 02210, through which it markets and sells or has marketed and sold the infringing products described herein.

7. This Court also has personal jurisdiction over Omilia because, upon information and belief, Omilia has marketed and sold the infringing products described herein to customers in this State.

8. This Court also has personal jurisdiction over Omilia because, upon information and belief, end-users of the infringing products described herein are residents of this State.

9. In the alternative, to the extent Omilia contests personal jurisdiction in this State, service or waiver of the summons in this action will establish that this Court has personal jurisdiction over Omilia under Fed. R. Civ. P. 4(k). Omilia states that it currently “work[s] with a number of financial institutions and telecom operators in the USA, who want to offer their customer base a truly user-friendly, effective, omni-channel self-service solution, while slashing operating costs.”<sup>1</sup> Upon information and belief, Omilia markets and sells the infringing products described herein to customers throughout the United States. Upon information and belief Omilia attends and has attended trade shows in the United States for the purpose of marketing and selling the infringing products, including in Washington, D.C., Santa Monica, CA, Orlando, FL, and Las Vegas NV. Upon information and belief, end-users of the infringing products described

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<sup>1</sup> <https://omilia.com/about-us/>.

herein reside throughout the United States. Thus, to the extent that Omilia “is not subject to jurisdiction in any state’s courts of general jurisdiction,” “exercising jurisdiction [would] nevertheless [be] consistent with the United States Constitution and laws.”

10. Venue is proper in this District under 28 U.S.C. §§ 1391(b)(1)-(3) because Omilia is subject to personal jurisdiction in the State of Massachusetts and thus resides in this District for the purposes of venue. In the alternative, to the extent Omilia does not reside in this District or elsewhere in the United States for venue purposes, Omilia is subject to suit in any judicial district, including this District, under 28 U.S.C. § 1391(c)(3). Further, because Nuance is a resident of this District and the owner of the Asserted Patents, a substantial part of the events or omissions giving rise to the claim – Omilia’s infringement – occurred in this District. Venue is also proper in this District under 28 U.S.C. § 1400(b) because Omilia resides in this District for venue purposes, and because it has committed acts of infringement and has or has had a regular and established place of business in this District.

## **FACTS**

### **The Asserted Patents**

11. The ’905 Patent is titled, “In-the-field adaptation of a large vocabulary automatic speech recognizer (ASR).” The U.S. Patent and Trademark Office (“PTO”) issued the ’905 Patent on March 17, 2009. Nuance is the owner by assignment of all rights, title, and interests in and to the ’905 Patent, including all rights to bring actions and recover damages for infringement thereof. A true and correct copy of the ’905 Patent is attached as **Exhibit A**.

12. The ’993 Patent is titled, “Speech recognition based on pronunciation modeling.” The PTO issued the ’993 Patent on September 10, 2013. Nuance is the owner by assignment of all rights, title, and interests in and to the ’993 Patent, including all rights to bring actions and

recover damages for infringement thereof. A true and correct copy of the '993 Patent is attached as **Exhibit B**.

13. The '839 Patent is titled, "Using an automated speech application environment to automatically provide text exchange services." The PTO issued the '839 Patent on September 27, 2011. Nuance is the owner by assignment of all rights, title, and interests in and to the '839 Patent, including all rights to bring actions and recover damages for infringement thereof. A true and correct copy of the '839 Patent is attached as **Exhibit C**.

14. The '534 Patent is titled, "Dynamically extending the speech prompts of a multimodal application." The PTO issued the '534 Patent on August 27, 2013. Nuance is the owner by assignment of all rights, title, and interests in and to the '534 Patent, including all rights to bring actions and recover damages for infringement thereof. A true and correct copy of the '534 Patent is attached as **Exhibit D**.

15. The '804 Patent is titled, "Using a complex events processor (CEP) to direct the handling of individual call sessions by an interactive voice response (IVR) system." The PTO issued the '804 Patent on February 19, 2013. Nuance is the owner by assignment of all rights, title, and interests in and to the '804 Patent, including all rights to bring actions and recover damages for infringement thereof. A true and correct copy of the '804 Patent is attached as **Exhibit E**.

16. The '532 Patent is titled, "Supporting multi-lingual user interaction with a multimodal application." The PTO issued the '532 Patent on December 9, 2014. Nuance is the owner by assignment of all rights, title, and interests in and to the '532 Patent, including all rights to bring actions and recover damages for infringement thereof. A true and correct copy of the '532 Patent is attached as **Exhibit F**.

17. The ‘688 Patent is titled, “Multi-lingual speech recognition with cross-language context modeling.” The PTO issued the ‘688 Patent on December 12, 2006. Nuance is the owner by assignment of all rights, title, and interests in and to the ‘688 Patent, including all rights to bring actions and recover damages for infringement thereof. A true and correct copy of the ‘688 Patent is attached as **Exhibit G**.

18. The ‘925 Patent is titled, “Method and apparatus for phonetic context adaptation for improved speech recognition.” The PTO issued the ‘925 Patent on February 14, 2006. Nuance is the owner by assignment of all rights, title, and interests in and to the ‘925 Patent, including all rights to bring actions and recover damages for infringement thereof. A true and correct copy of the ‘925 Patent is attached as **Exhibit H**.

#### **Omilia’s Infringing Conduct**

19. Rather than attempt to develop its own products to compete fairly with Nuance in the marketplace following the termination of the relationship, Omilia replicated Nuance’s innovative technology and infringed Nuance’s valuable intellectual property.

20. According to Omilia’s website, Omilia entered the “North American market” in 2015, and in 2016 “deployed the first ever truly Conversational Virtual Agent solution for Royal Bank of Canada, the largest and most innovative bank in the country.”<sup>2</sup> The website further asserts that “[t]oday, [Omilia is] working with a number of financial institutions and telecom operators in the USA, who want to offer their customer base a truly user-friendly, effective, omni-channel self-service solution, while slashing operating costs.”<sup>3</sup>

21. Omilia describes its software platform as including “Artificial Intelligence and Natural Language Understanding,” “Conversational Virtual Agents,” “Natural Language UI,”

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<sup>2</sup> <https://omilia.com/about-us/>.

<sup>3</sup> *Id.*

“an “intelligent Dialog Management platform (DiaManT<sup>®</sup>),” “an innovative Natural Language Understanding engine (deepNLU<sup>®</sup>),” and “the most accurate on-premise ASR engine (deepASR<sup>®</sup>) in the world, with accuracies in the Banking and Telecoms domains touching human-level performance.”<sup>4</sup>

22. Omilia claims that these technologies “offer a true conversational IVR experience” and “ensure[] accurate speaker identification.”<sup>5</sup>

23. Again according to Omilia’s website, Omilia integrates or packages these technologies into an “Omni-Channel Conversational Platform” it calls “DiaManT<sup>®</sup>” that “provides the infrastructure and core capabilities to power an omni-channel conversational experience.” Omilia describes this platform as a “single unified platform for conversational customer service on all channels”<sup>6</sup> (the “Accused IVR Platform”).

24. Omilia asserts that it can structure the Accused IVR Platform depending on the particular application and customer needs, including “Xpert<sup>®</sup> Packages” for banking, telecoms, insurance, travel, and utilities customers.<sup>7</sup> The Accused IVR Platform can also include an “omIVR Call Center” that “is a “telco-grade IVR capability that allows DiaManT<sup>®</sup> to easily integrate with [an] enterprise’s telephony.”<sup>8</sup>

25. Omilia further states that using “Digital Channel Plug-in’s,” it can configure the Accused IVR Platform to operate with mobile phones or text-based applications like SMS text-messaging, email, or Facebook Messenger.<sup>9</sup>

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<sup>4</sup> *Id.*

<sup>5</sup> *Id.*

<sup>6</sup> <https://omilia.com/technology/omni-channel-conversational-platform/>; <https://omilia.com/>.

<sup>7</sup> *Id.*

<sup>8</sup> *Id.*

<sup>9</sup> *Id.*

26. Upon information and belief, the Accused IVR Platform infringes one or more claims of the Asserted Patents, including at least one claim of each of the Asserted Patents, as described below.

27. Omilia has known about the '905 Patent, the '993 Patent, and the '804 Patent and its infringement thereof since at least October 9, 2018, when Omilia received a letter from Nuance identifying these patents and the aspects of Accused IVR Platform that meet the claims of the patents. On or around October 22, 2018, Omilia sent a response letter stating that it would examine the patents and provide a response. On or around February 12, 2019, Nuance finally received follow-up correspondence, but said correspondence contained no substantive response on the identified issues. On or around March 12, 2019, Nuance received additional correspondence simply stating, without explanation, that "Omilia does not infringe the Nuance patents" and referencing unidentified alleged "prior art publications that are relevant to the Nuance patent claims." On or around March 15, 2019, Nuance requested further details and a substantive response from Omilia, but has not received any response.

28. Upon information and belief, Omilia was aware of the '839, '534, '532, '688, and '925 Patents at least as of the date of the filing of this Complaint.

29. Omilia's infringement is deliberate, willful, and knowing, with conscious disregard of Nuance's rights, entitling Nuance to enhanced damages.

30. Omilia's infringement is causing irreparable harm and monetary damages to Nuance, entitling Nuance to both monetary damages and injunctive relief.

**COUNT I: INFRINGEMENT OF THE '905 PATENT**  
**UNDER 35 U.S.C. § 271**

31. Nuance incorporates by reference the allegations contained in the foregoing paragraphs as though fully stated herein.



32. Omilia and/or its customers directly infringe one or more claims of the '905 Patent under 35 U.S.C. § 271(a), including at least Claim 1, either literally or under the doctrine of equivalents by making, using, offering to sell, selling, and/or importing the Accused IVR Platform in the United States without permission or license from Nuance.

33. By way of example only and not limitation, Claim 1 of the '905 Patent claims:

1. A method of improving the recognition accuracy of a speech recognizer comprising the steps of:

deploying the speech recognizer in an environment to receive live input data;

receiving the live input data and an original speech signal;

without supervision, selecting at least one adaptation algorithm from a plurality of adaptation algorithms, and

applying the selected adaptation algorithm to the received live input data,

said live input data and original speech signal being in the form of speech data required for executing the adaptation algorithm, as it is being recognized to improve at least one application-specific feature for the recognition accuracy of the speech recognizer; and

redeploying the adapted speech recognizer in the target environment.

34. The Accused IVR Platform meets each element in at least Claim 1 of the '905 Patent. For example, Omilia and/or its customers utilizing the Accused IVR Platform perform a “method of improving the recognition accuracy of a speech recognizer.” Omilia states that the Accused IVR Platform includes an improved automatic speech recognizer (“ASR”):<sup>10</sup>

Today we are proud to have the most accurate on-premise ASR engine (deepASR®) in the world, with accuracies in the Banking and Telecoms domains touching human-level performance. But we don't stop there: our deepNLU® engine is capable of delivering unprecedented levels of semantic accuracy in conversational dialogs never seen again in live environments, while our deepVB® Biometrics Authentication engine ensures accurate speaker identification.

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<sup>10</sup> <https://omilia.com/about-us/> (annotated by counsel).

35. Omilia and/or its customers utilizing the Accused IVR Platform perform the step of “deploying the speech recognizer in an environment to receive live input data.” The Accused IVR Platform receives and services customer calls:<sup>11</sup>

Today we are proud to have the most accurate on-premise ASR engine (deepASR®) in the world, with accuracies in the Banking and Telecoms domains touching human-level performance. But we don't stop there: our deepNLU® engine is capable of delivering unprecedented levels of semantic accuracy in conversational dialogs never seen again in live environments, while our deepVB® Biometrics Authentication engine ensures accurate speaker identification.



deepNLU®

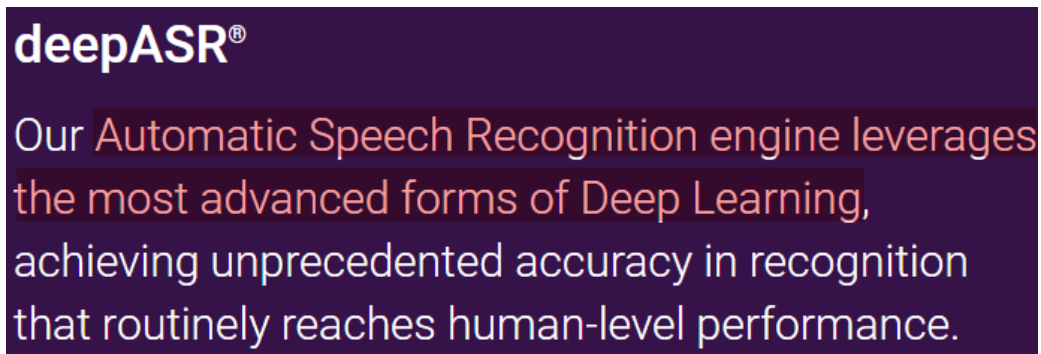
DiaManT® is home to Omilia's deepNLU® Engine that works to extract meaning from free, unstructured language. The deepNLU® Engine makes it possible to understand customer requests and intents with human-like accuracy. Because the engine is context aware and retains memory, it is capable of running entire end-to-end conversations with customers.

36. Omilia and/or its customers utilizing the Accused IVR Platform perform the step of “receiving the live input data and an original speech signal.” The Accused IVR Platform receives live input data and an original speech signal from a caller.

37. Omilia and/or its customers utilizing the Accused IVR Platform perform the step of “without supervision, selecting at least one adaptation algorithm from a plurality of adaptation algorithms.” Omilia touts the Accused IVR Platform as having an ASR engine that can adapt dynamically to recognize speech when it detects different languages or accents. Upon

<sup>11</sup> *Id.* (annotated by counsel); <https://omilia.com/technology/omni-channel-conversational-platform/> (annotated by counsel).

information and belief, the Accused IVR Platform achieves this at least by selecting adaptation algorithms tailored for different languages or accents:<sup>12</sup>



## deepASR® Languages

Today, our engine excels in recognizing 17 languages including English (US, Canada, UK, & South Africa), Spanish, Russian, Polish, Kazakh, Ukrainian and Greek.

Thanks to Omilia's proprietary method of training and tuning, deepASR® is able to achieve Word Error Rates of less than half of legacy incumbent providers.

For all primary languages Omilia offers adapted acoustic and language models that cover the accent and dialectic variations within the country.

In many cases the sound quality reaching the call center can be very poor due to many reasons — because most recognition engines are trained in a laboratory to understand perfect quality sound, they inevitably fail in the real world where sound quality is usually sub-par. Omilia has solved this problem by training our recognition models with real world call center audio to optimize the language and acoustic models of our ASR engine. With this personalized approach to speech recognition Omilia reached unprecedented accuracy in speech to text transcription.

38. Omilia and/or its customers utilizing the Accused IVR Platform perform the step of “applying the selected adaptation algorithm to the received live input data.” Upon information and belief, at least because the Accused IVR Platform is able to adapt to recognize and process various languages or accents as described in the previous paragraph, the Accused IVR Platform is applying selected adaptation algorithms corresponding to the user’s accent or language to the live input data.

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<sup>12</sup> <https://omilia.com/technology/dnn-speech-recognition/> (annotated by counsel).

39. Upon information and belief, Omilia and/or its customers utilizing the Accused IVR Platform perform the step of “said live input data and original speech signal being in the form of speech data required for executing the adaptation algorithm, as it is being recognized to improve at least one application-specific feature for the recognition accuracy of the speech recognizer.” Moreover, upon information and belief the Accused IVR Platform is capable of performing such step because in order to perform effective ASR for various accents and languages, the Accused IVR Platform is configured to adapt to a change from one accent or language to another accent or language. As adaptation algorithms are deployed, at least the ability to recognize a new accent or language would represent an improvement to at least one application-specific feature. Further, upon information and belief, the Accused IVR Platform’s adaptation algorithms are configured to compare speech data to determine if a new speech transcription would improve at least one application-specific feature for the recognition accuracy.

40. Omilia and/or its customers utilizing the Accused IVR Platform perform the step of “redeploying the adapted speech recognizer in the target environment.” Upon information and belief, in order for the Accused IVR Platform to achieve satisfactory or improved recognition, the ASR is redeployed in the environment after adapting to different accents or languages through the use of the adaptation algorithms.

41. Omilia also induces the infringement of the ’905 Patent by its customers in the United States as discussed above under 35 U.S.C. § 271(b), both by configuring the Accused IVR Platform to operate in a manner that Omilia knows would infringe the methods claimed in the ’905 Patent and by encouraging its customers to use the Accused IVR Platform in a manner that Omilia knows would infringe the methods claimed in the ’905 Patent. Omilia has had

knowledge of the '905 Patent since at least October 9, 2018. According to Omilia's website, through its "Certified Partner Program," Omilia has worked with Concentrix Corporation/Convergys, Speech-Soft Solutions, LLC, and NICE inContact to make, use, offer to sell, or sell the Accused IVR Platform in the United States:<sup>13</sup>

## Partners

Omilia is dedicated to empowering both our Customer as well as our Partners to deliver and manage true conversational solutions. Through our Certified Partner Program, we have created a global network of local partners that are helping to bring the next generation of conversational user interfaces to enterprises around the world.



42. Omilia has also sold or offered to sell the Accused IVR Platform in an infringing configuration to its customers, which, on information and belief, have utilized the Accused IVR Platform in the United States:<sup>14</sup>

<sup>13</sup> <https://omilia.com/our-partners/> (annotated by counsel).

<sup>14</sup> *Id.*



43. Omilia also contributes to the infringement of the '905 Patent by its customers in the United States as discussed above under 35 U.S.C. § 271(c). Omilia has had knowledge of the '905 Patent since at least October 9, 2018. The Accused IVR Platform is a material part of practicing at least the methods of Claim 1 of the '905 Patent, has no substantial non-infringing uses, is not a staple article of commerce, and is specifically made and adapted for use in an infringing manner, as discussed above.

44. Upon information and belief, Omilia has made and is continuing to make unlawful gains and profits from its infringement of the '905 Patent.

45. As detailed above, Omilia has continued its infringement despite having knowledge of the '905 Patent and Nuance's infringement claims.

46. Omilia's infringement has caused and will continue to cause irreparable harm to Nuance unless Omilia's infringing activities are preliminarily and permanently enjoined by this Court.

47. Omilia's infringement has also caused monetary damages to Nuance in an amount to be determined at trial.

**COUNT II: INFRINGEMENT OF THE '993 PATENT**  
**UNDER 35 U.S.C. § 271**

48. Nuance incorporates by reference the allegations contained in the foregoing paragraphs as though fully stated herein.

49. Omilia and/or its customers directly infringe one or more claims of the '993 Patent under 35 U.S.C. § 271(a), including at least Claim 17, either literally or under the doctrine of equivalents by making, using, offering to sell, selling, and/or importing the Accused IVR Platform in the United States without permission or license from Nuance.

50. By way of example only and not limitation, Claim 17 of the '993 Patent claims:

17. A computer-readable storage device having instructions stored which, when executed on a processor, cause the processor to perform operations comprising:

approximating transcribed speech using a phonemic transcription dataset associated with a speaker, to yield a language model, where the phonemic transcription dataset is based on a pronunciation model of the speaker;

incorporating, into the language model, pronunciation probabilities associated with respective unique labels for each different pronunciation of a word,

wherein the respective unique label for a most frequent word indicates a special status in the language model; and

after incorporating the pronunciation probabilities into the language model, recognizing an utterance using the language model.

51. The Accused IVR Platform meets each element in at least Claim 17 of the '993 Patent. For example, to the extent the preamble of Claim 17 is limiting, the Accused IVR Platform includes a "computer-readable storage device having instructions stored which, when executed on a processor, cause the processor to perform operations."



52. The operations capable of being performed by the Accused IVR Platform include “approximating transcribed speech using a phonemic transcription dataset associated with a speaker, to yield a language model, where the phonemic transcription dataset is based on a pronunciation model of the speaker.” Omilia represents that the Accused IVR Platform has good speech recognition capabilities for various accents and languages that comes from the development of ASR models using actual recorded speech from real calls. Upon information and belief, the Accused IVR Platform does so at least by using a phonemic transcription dataset based on pronunciation models associated with various accents or languages to transcribe speech:<sup>15</sup>

## deepASR<sup>®</sup> Languages

Today, our engine excels in recognizing 17 languages including English (US, Canada, UK, & South Africa), Spanish, Russian, Polish, Kazakh, Ukrainian and Greek.

Thanks to Omilia’s proprietary method of training and tuning, deepASR<sup>®</sup> is able to achieve Word Error Rates of less than half of legacy incumbent providers.

For all primary languages Omilia offers adapted acoustic and language models that cover the accent and dialectic variations within the country.

## Why deepASR<sup>®</sup> succeeds where others fail?

Your customers do not speak one single language — in reality your customers have a very wide range of accents and ways of expressing themselves. In today’s globalized economy there is no “one size fits all” for any language model. In the past strong accents, slang and ethnic vocabulary make companies nervous about new speech technologies. This reservation towards speech technologies stems from over-promised and under-delivered solutions from our competitors, that just didn’t quite work outside their lab.

In many cases the sound quality reaching the call center can be very poor due to many reasons — because most recognition engines are trained in a laboratory to understand perfect quality sound, they inevitably fail in the real world where sound quality is usually sub-par. Omilia has solved this problem by training our recognition models with real world call center audio to optimize the language and acoustic models of our ASR engine. With this personalized approach to speech recognition Omilia reached unprecedented accuracy in speech to text transcription.

53. The operations capable of being performed by the Accused IVR Platform include “incorporating, into the language model, pronunciation probabilities associated with respective

<sup>15</sup> <https://omilia.com/technology/dnn-speech-recognition/> (annotated by counsel).



unique labels for each different pronunciation of a word.” Upon information and belief, the Accused IVR Platform is capable of recognizing open-ended utterances, indicating that it uses a statistical language model (“SLM”) for speech recognition. Omilia claims that the Accused IVR Platform is capable of recognizing different accents or languages while still achieving reduced error rates, indicating that the Accused IVR Platform assigns pronunciation probabilities to different pronunciations of a word. Omilia also claims that the Accused IVR Platform tracks words and performs statistical analysis on historical data, further indicating that the Accused IVR Platform uses probability-based techniques in its language models:<sup>16</sup>

## deepASR® Languages





Today, our engine excels in recognizing 17 languages including English (US, Canada, UK, & South Africa), Spanish, Russian, Polish, Kazakh, Ukrainian and Greek.

Thanks to Omilia's proprietary method of training and tuning, deepASR® is able to achieve Word Error Rates of less than half of legacy incumbent providers.

For all primary languages Omilia offers adapted acoustic and language models that cover the accent and dialectic variations within the country.

### omAnalytics features

Deep analysis of customer conversations with DiaManT® and live Agents to provide insight into “what” customers are saying. View a conceptual mapping of concepts and words that customers are saying. By drilling down on each topic you can even click a link to hear what the customer said.

|   |   |   |   |
|---|---|---|---|
|  |  |  |  |
| <p>Discovery of frequent terms, phrases, and concepts</p>                           | <p>Search conversations for specific Products and Actions</p>                       | <p>Swiftly identify and take action on the root cause of issues</p>                 | <p>Find any combination of metadata, words and phrases</p>                            |

<sup>16</sup> <https://omilia.com/technology/dnn-speech-recognition/> (annotated by counsel); <https://omilia.com/technology/business-insights/> (annotated by counsel); <https://aws.amazon.com/solutions/case-studies/Omilia/> (annotated by counsel).

But how has Omilia gotten this far? One of its major assets is the data it has from a long history of working with its client base. Researchers at the company have built deep learning models, which they train with millions of samples of real speech. The second key to the company's success is Amazon Web Services (AWS). Storing and processing the data to train the machine learning models requires enormous compute capacity—something that was simply unaffordable for a bootstrap company of 15 people, as Omilia was in 2013.

54. The “respective unique label for a most frequent word” within the Accused IVR Platform “indicates a special status in the language model.” Upon information and belief, the Accused IVR Platform uses a SLM and uses a probabilistic assessment to indicate special status in the language model for the most frequently used words.

55. “[A]fter incorporating the pronunciation probabilities into the language model,” the Accused IVR Platform “recogniz[es] an utterance using the language model.” Upon information and belief, at least because the Accused IVR Platform uses SLM and assigns pronunciation probabilities to different pronunciations of a word in a language model, the Accused IVR Platform recognizes utterances based on this language model.

56. Omilia also induces the infringement of the '993 Patent by its customers in the United States as discussed above under 35 U.S.C. § 271(b), both by configuring the Accused IVR Platform to operate in a manner that Omilia knows infringes the '993 Patent and by encouraging its customers to use the Accused IVR Platform in a manner that Omilia knows infringes the '993 Patent. Omilia has had knowledge of the '993 Patent since at least October 9, 2018. According to Omilia's website, through its “Certified Partner Program,” Omilia has worked with Concentrix Corporation/Convergys, Speech-Soft Solutions, LLC, and NICE

inContact to make, use, offer to sell, or sell the Accused IVR Platform in the United States. *See* ¶ 41.

57. Omilia has also sold or offered to sell the Accused IVR Platform in an infringing configuration to its customers in the United States. *See* ¶ 42.

58. Omilia also contributes to the infringement of the '993 Patent by its customers in the United States as discussed above under 35 U.S.C. § 271(c). Omilia has had knowledge of the '993 Patent since at least October 9, 2018. The Accused IVR Platform is a material part of practicing at least the methods of Claim 17 of the '993 Patent, has no substantial non-infringing uses, is not a staple article of commerce, and is specifically made and adapted for use in an infringing manner, as discussed above.

59. Upon information and belief, Omilia has made and is continuing to make unlawful gains and profits from its infringement of the '993 Patent.

60. As detailed above, Omilia has continued its infringement despite having knowledge of the '993 Patent and Nuance's infringement claims.

61. Omilia's infringement has caused and will continue to cause irreparable harm to Nuance unless Omilia's infringing activities are preliminarily and permanently enjoined by this Court.

62. Omilia's infringement has also caused monetary damages to Nuance in an amount to be determined at trial.

**COUNT III: INFRINGEMENT OF THE '839 PATENT**  
**UNDER 35 U.S.C. § 271**

63. Nuance incorporates by reference the allegations contained in the foregoing paragraphs as though fully stated herein.

64. Omilia and/or its customers directly infringe one or more claims of the '839 Patent under 35 U.S.C. § 271(a), including at least Claim 17, either literally or under the doctrine of equivalents by making, using, offering to sell, selling, and/or importing the Accused IVR Platform in the United States without permission or license from Nuance.

65. By way of example only and not limitation, Claim 17 of the '839 Patent claims:

17. A system for providing text exchange services comprising:

a text exchange client configured to send and receive real-time text exchanges over a text exchange channel;

a speech application environment configured to execute an automated speech response application that permits users to interact in real-time over a voice channel; and

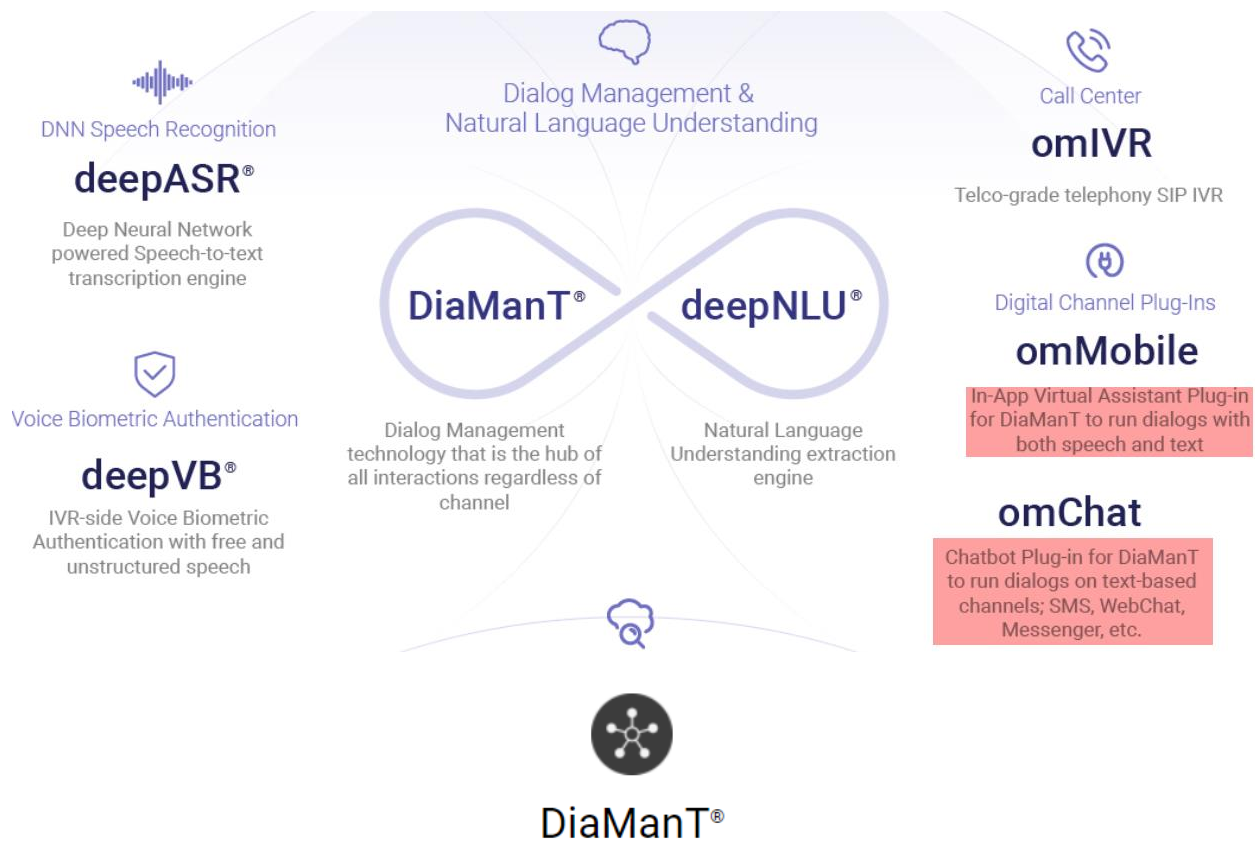
a Chatbot server configured to establish a communication session involving the text exchange client and the automated speech response application,

wherein the Chatbot server can dynamically convert messages between the text exchange client and the speech response application during the communication session in a manner transparent to the text exchange client and to the automated speech response application.

66. The Accused IVR Platform meets each element in at least Claim 17 of the '839 Patent. For example, to the extent the preamble of Claim 17 is limiting, the Accused IVR Platform includes a “system for providing text exchange services.” In addition to providing speech applications, the Accused IVR Platform is configured to provide text exchange services that allow customers to interact through SMS text messaging, email, FaceBook Messenger, or other text-based applications:<sup>17</sup>

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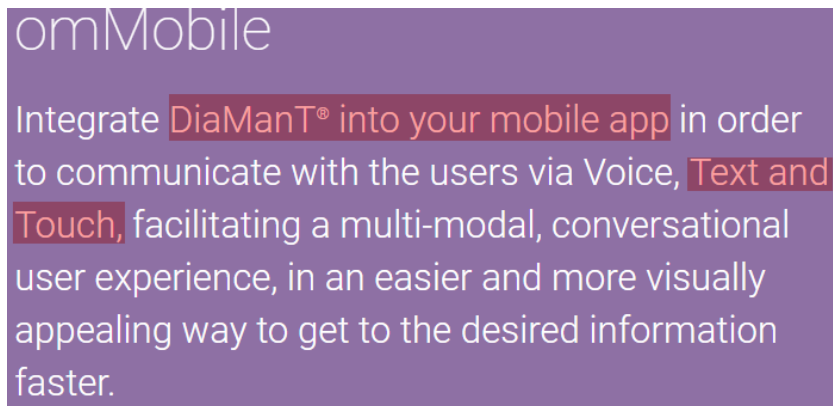
<sup>17</sup> <https://omilia.com/> (annotated by counsel); <https://omilia.com/technology/omni-channel-conversational-platform/> (annotated by counsel).



Omilia's Dialog Management Technology is the hub for conversational care on all channels. **DiaManT® can interact with users via Speech, Text, or GUI input; inbound and outbound from the IVR, Web-Chat or even from any enabled Mobile application, delivering true continuity for seamless cross-channel service in the form of Plug-Ins; omMobile®, omChat®, omIVR®.**

## omChat

With the omChat plug-in **DiaManT® takes the form of a ChatBot on text-based channels: SMS, Web-Chat, Email, and Facebook Messenger.**



67. The system of the Accused IVR Platform includes “a text exchange client configured to send and receive real-time text exchanges over a text exchange channel.” At least because the Accused IVR Platform allows customers to perform transactions such as mobile banking through text commands, the Accused IVR Platform’s constituent applications, like omChat or omMobile, must be configured to interact in real-time over a text exchange channel with another text exchange device, like a bank server.

68. The system of the Accused IVR Platform includes “a speech application environment configured to execute automated an automated speech response application that permits users to interact in real-time over a voice channel.” At least because the Accused IVR Platform allows customers to perform transactions such as mobile banking using speech commands, the Accused IVR Platform must have a speech application environment. The speech application environment of the Accused IVR Platform is configured to execute automated speech response applications that permit users to interact in real-time over a voice channel. *See* ¶¶ 354, 66-67.

69. The system of the Accused IVR Platform includes “a Chatbot server configured to establish a communication session involving the text exchange client and the automated speech response application.” As described above, the Accused IVR Platform is an integrated platform that includes both ASR engines for speech recognition and text exchange services with

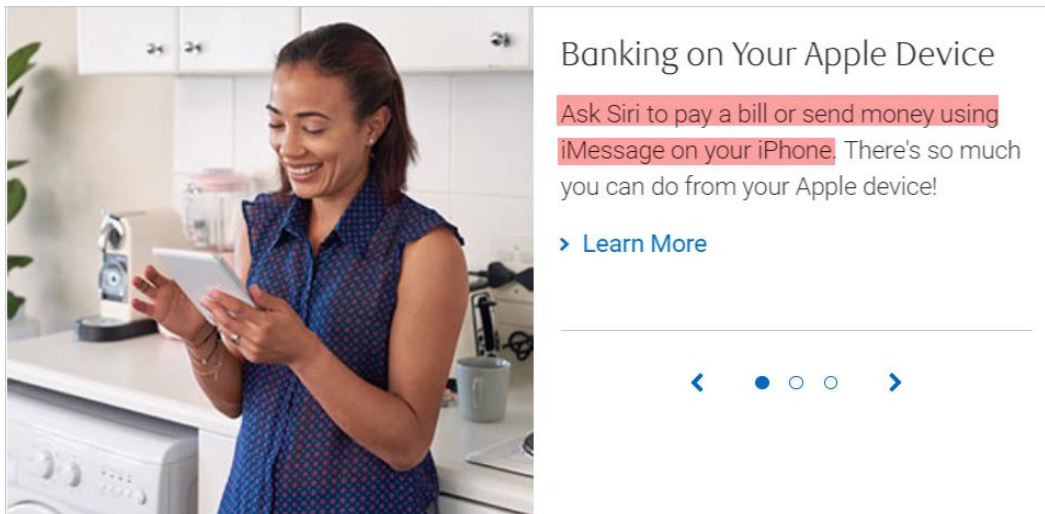
applications such as omChat and omMobile. Upon information and belief, the integrated environment of the Accused IVR Platform establishes a communication session between such ASR engines and text exchange services. Further, customers utilizing the Accused IVR Platform at least in the financial services context can conduct banking transactions through text and email or speech commands.<sup>18</sup>

### Pay Current and Future Bills

It's simple to manage all your bill payments—edit your payee list, pay a current bill and set up upcoming payments. Plus, you can also pay a bill using voice commands with Siri for RBC Mobile on an iPhone.

### Send Money By Email, Text Message or Voice Command

Send an *Interac* e-Transfer or pay another RBC client for free<sup>4</sup> by email or text message. If you have an iPhone, you can also send money using voice commands with Siri for RBC Mobile or through an iMessage.



70. The Chatbot server of the Accused IVR Platform is capable of “dynamically convert[ing] messages between the text exchange client and the speech response application during the communication session in a manner transparent to the text exchange client and to the

<sup>18</sup> <https://www.rbcroyalbank.com/ways-to-bank/mobile/rbc-mobile-app/index.html> (annotated by counsel); <https://www.rbcroyalbank.com/ways-to-bank/mobile/index.html> (annotated by counsel).



automated speech response application.” As described above and below, the Accused IVR Platform is an integrated, omni-channel technology that can dynamically and automatically convert interactions between a voice recognition server channel and a text exchange channel during a communication session.<sup>19</sup>

**DiaManT®**

The DiaManT® platform provides the infrastructure and core capabilities to power an omni-channel conversational experience, acting as a single-point of integration with enterprise systems for driving conversational dialogs on all channels.

**Digital Channel Plug-in's**

By leveraging DiaManT® Digital Channel Plug-in's, omMobile and omChat, the enterprise can open up all channels to be serviced by the same application, and customers can experience the same great conversational service on digital channels, with Text, Voice or GUI input.

## omMobile features

DiaManT® and omMobile support cross-channel continuity and hand-off, allowing users to start their interaction on a mobile app and seamlessly continue interacting over IVR or web-chat, with full context preservation.

71. Omilia also induces the infringement of the '839 Patent by its customers in the United States as discussed above under 35 U.S.C. § 271(b), both by configuring the Accused IVR Platform to operate in a manner that Omilia knows infringes the '839 Patent and by encouraging its customers to use the Accused IVR Platform in a manner that Omilia knows infringes the '839 Patent. Omilia has had knowledge of the '839 Patent since at least the filing

<sup>19</sup> <https://omilia.com/technology/omni-channel-conversational-platform/> (annotated by counsel).



of this Complaint. According to Omilia's website, through its "Certified Partner Program," Omilia has worked with Concentrix Corporation/Convergys, Speech-Soft Solutions, LLC, and NICE inContact to make, use, offer to sell, or sell the Accused IVR Platform in the United States. *See* ¶ 41.

72. Omilia has also sold or offered to sell the Accused IVR Platform in an infringing configuration to its customers in the United States. *See* ¶ 42.

73. Omilia also contributes to the infringement of the '839 Patent by its customers in the United States as discussed above under 35 U.S.C. § 271(c). Omilia has had knowledge of the '839 Patent at least as of the filing of this Complaint. The Accused IVR Platform is a material part of practicing at least the methods of Claim 17 of the '839 Patent, has no substantial non-infringing uses, is not a staple article of commerce, and is specifically made and adapted for use in an infringing manner, as discussed above.

74. Upon information and belief, Omilia has made and is continuing to make unlawful gains and profits from its infringement of the '839 Patent.

75. Omilia's infringement has caused and will continue to cause irreparable harm to Nuance unless Omilia's infringing activities are preliminarily and permanently enjoined by this Court.

76. Omilia's infringement has also caused monetary damages to Nuance in an amount to be determined at trial.

**COUNT IV: INFRINGEMENT OF THE '534 PATENT**  
**UNDER 35 U.S.C. § 271**

77. Nuance incorporates by reference the allegations contained in the foregoing paragraphs as though fully stated herein.

78. Omilia and/or its customers directly infringe one or more claims of the '534 Patent under 35 U.S.C. § 271(a), including at least Claim 13, either literally or under the doctrine of equivalents by making, using, offering to sell, selling, and/or importing the Accused IVR Platform in the United States without permission or license from Nuance.

79. By way of example only and not limitation, Claim 13 of the '534 Patent claims:

13. A computer program product for dynamically extending speech prompts of a multimodal application, the computer program product comprising:

a recordable media having computer program instructions configured to:

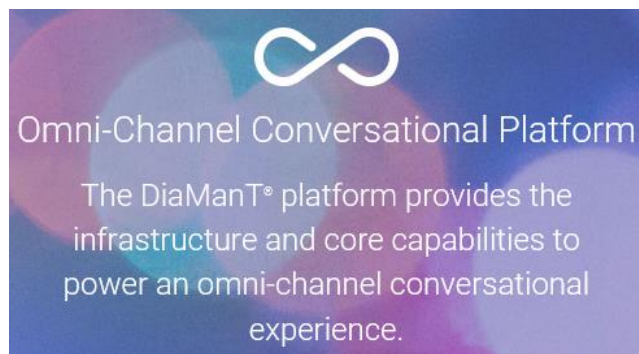
receive a media file having a metadata container;

retrieve, from the metadata container, a speech prompt related to content stored in the media file for inclusion in the multimodal application; and

modify, the multimodal application to include the speech prompt.

80. The Accused IVR Platform meets each element in at least Claim 13 of the '534 Patent. For example, to the extent the preamble of Claim 13 is limiting, the Accused IVR Platform includes a “computer program product for dynamically extending speech prompts of a multimodal application.”

81. The Accused IVR Platform includes “a recordable media having computer program instructions.” As discussed above, the Accused IVR Platform is a software platform:<sup>20</sup>






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<sup>20</sup> <https://omilia.com/technology/omni-channel-conversational-platform/>

82. The computer program instructions of the Accused IVR Platform are configured to “receive a media file having a metadata container.” As discussed above, the Accused IVR Platform is configured to operate on a mobile device through an application such as omMobile, which supports user interaction through voice commands or non-voice commands like text-based exchanges. On information and belief, at least because the Accused IVR Platform saves or records call data and analyzes it for use in processing calls and/or building models, the media file of the Accused IVR Platform includes a media file (such as an audio recording) and an associated metadata container. The media file with a metadata container of the Accused IVR Platform is received as part of the process of importing the media file;<sup>21</sup> *see also* ¶ 53.

## omIVR features

omIVR executes the dialog call-flow and invokes the services of deepASR<sup>®</sup> for speech-to-text, and omTTS<sup>®</sup> for speech synthesis, through the industry standard MRCP protocol. It runs on both physical and virtual hardware, providing a highly scalable system to meet all your business and technical requirements.

|   |   |   |
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|    |    |    |
| <p>The DRTviewer<sup>®</sup> is a web-based tool that provides real-time transparency to all customer interactions on DiaManT<sup>®</sup>, regardless of channel. Via the DRTviewer<sup>®</sup> tool, business users can monitor live sessions in real-time as well as search through historical dialogs.</p> | <p>Omilia offers a web-based automated reporting module that presents statistical data regarding the use of the application, making it easy to analyze user interactions and measure KPI's. omReports<sup>®</sup> present key metrics of the system's performance in an analytical way — making it possible to identify areas for increased automation.</p> | <p>Visualize the big data generated by DiaManT<sup>®</sup> to analyze customer conversations with the virtual agent as well as with live agents. omAnalytics<sup>®</sup> provides real-time business discovery on what customers are actually saying, with detailed Topic and Sentiment Analysis on natural language feedback from consumers.</p> |

83. The computer program instructions of the Accused IVR Platform are configured to “retrieve from the metadata container, a speech prompt related to content stored in the media file for inclusion in the multimodal application.” A speech prompt, as used in the '534 Patent, is “an audio phrase played by a multimodal application to provoke a response from a user,” and

<sup>21</sup> <https://omilia.com/technology/omni-channel-conversational-platform/> (annotated by counsel).

includes at least a text string prompt for execution by a text to speech engine or an audio prompt to be played by the multimodal device. Upon information and belief, at least because it is configured to interact with users in “unstructured” conversations, the metadata container is configured to retrieve a speech prompt related to the content stored in the media file.

84. The computer program instructions of the Accused IVR Platform are configured to “modify the multimodal application to include the speech prompt.” The Accused IVR Platform includes appropriate speech prompts as part of its interactions with the caller to identify a caller’s intent from collected media files reflecting a call session:<sup>22</sup>

## omMobile features

DiaManT® and omMobile support cross-channel continuity and hand-off, allowing users to start their interaction on a mobile app and seamlessly continue interacting over IVR or web-chat, with full context preservation.

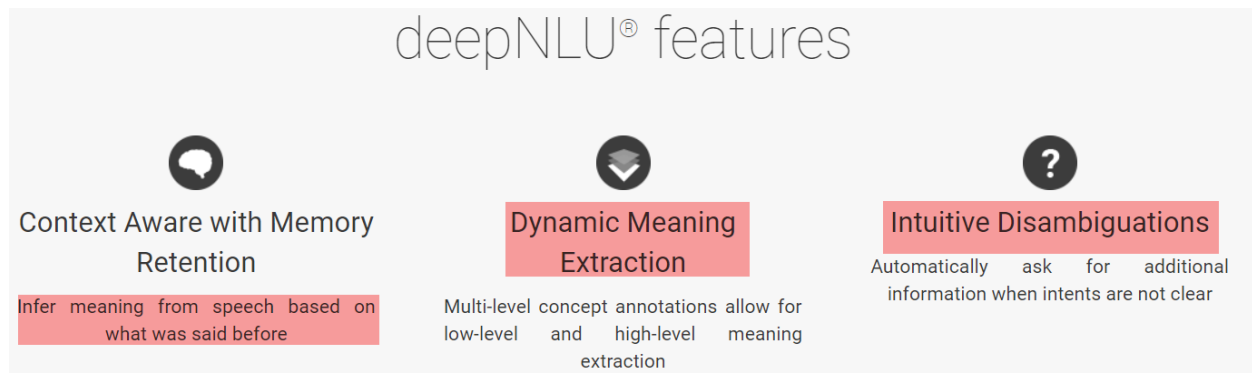
## Much more than just Call Steering

DiaManT® allows for true end-to-end conversations in natural language. In comparison to other vendors that only provide Call Steering with rigidly structured Directed Dialog, with DiaManT® customers can speak freely and there is no pre-determined flow or structure that they have to follow. With DiaManT® there is one single application that determines both the intent of the caller as well as the delivery of self-services, so customer conversations are completely unstructured, meaning that your customers will never hear things like “say main menu to go back” — they just speak, and DiaManT® listens, understands, and cares.

Upon information and belief, at least because the Accused IVR Platform maintains a record of an entire conversation so that it can create a customized user interaction and identify customer intent based on conversation history, the Accused IVR Platform is configured to modify the multimodal application to include the speech prompt once it identifies the user’s intent based on an analysis of the metadata container associated with the particular media file reflecting the conversation history:<sup>23</sup>

<sup>22</sup> <https://omilia.com/technology/omni-channel-conversational-platform/> (annotated by counsel)

<sup>23</sup> *Id.* (annotated by counsel).



85. Omilia also induces the infringement of the '534 Patent by its customers in the United States as discussed above under 35 U.S.C. § 271(b), both by configuring the Accused IVR Platform to operate in a manner that Omilia knows infringes the '534 Patent and by encouraging its customers to use the Accused IVR Platform in a manner that Omilia knows infringes the '534 Patent. Omilia has had knowledge of the '534 Patent since at least the filing of this Complaint. According to Omilia's website, through its "Certified Partner Program," Omilia has worked with Concentrix Corporation/Convergys, Speech-Soft Solutions, LLC, and NICE inContact to make, use, offer to sell, or sell the Accused IVR Platform in the United States. *See* ¶ 41.

86. Omilia has also sold or offered to sell the Accused IVR Platform in an infringing configuration to its customers in the United States. *See* ¶ 42.

87. Omilia also contributes to the infringement of the '534 Patent by its customers in the United States as discussed above under 35 U.S.C. § 271(c). Omilia has had knowledge of the '534 Patent at least as of filing of this Complaint. The Accused IVR Platform is a material part of practicing at least the methods of Claim 13 of the '534 Patent, has no substantial non-infringing uses, is not a staple article of commerce, and is specifically made and adapted for use in an infringing manner, as discussed above.

88. Upon information and belief, Omilia has made and is continuing to make unlawful gains and profits from its infringement of the '534 Patent.

89. Omilia's infringement has caused and will continue to cause irreparable harm to Nuance unless Omilia's infringing activities are preliminarily and permanently enjoined by this Court.

90. Omilia's infringement has also caused monetary damages to Nuance in an amount to be determined at trial.

**COUNT V: INFRINGEMENT OF THE '804 PATENT**  
**UNDER 35 U.S.C. § 271**

91. Nuance incorporates by reference the allegations contained in the foregoing paragraphs as though fully stated herein.

92. Omilia and/or its customers directly infringe one or more claims of the '804 Patent under 35 U.S.C. § 271(a), including at least Claim 1, either literally or under the doctrine of equivalents by making, using, offering to sell, selling, and/or importing the Accused IVR Platform in the United States without permission or license from Nuance.

93. By way of example only and not limitation, Claim 1 of the '804 Patent claims:

1. A system for managing individual call sessions of an interactive voice response (IVR) system comprising:

an interactive voice response (IVR) system configured to execute a plurality of interaction files for a call session corresponding to a calling entity in response to a unit of speech input provided by the calling entity,

wherein the IVR system converts the unit of speech input into a series of textual elements contained within event data messages, wherein the event data messages are associated with the call session by a unique Stream\_ID; and

a complex events processor (CEP) configured to dynamically modify the execution of the plurality of interaction files by the IVR system for the call session based on an analysis of the event data messages,

wherein said modification is contained within an action message sent by the CEP to the IVR system, wherein the action message is identified with the Stream\_ID corresponding to the analyzed the event data messages.

94. The Accused IVR Platform meets each element in at least Claim 1 of the '534 Patent. For example, the Accused IVR Platform is a “system for managing individual call sessions of an interactive voice response (IVR) system.” As discussed above, the Accused IVR Platform is a system that manages individual call sessions of an IVR system. See ¶¶ 35, 66-67, 70.

95. The Accused IVR Platform includes “an interactive voice response (IVR) system configured to execute a plurality of interaction files for a call session corresponding to a calling entity in response to a unit of speech input provided by the calling entity.” The Accused IVR Platform identifies a caller’s intent from collected speech units from a caller during a call session, and executes processes based on the identified intent.<sup>24</sup>

## omMobile features

DiaManT® and omMobile support cross-channel continuity and hand-off, allowing users to start their interaction on a mobile app and seamlessly continue interacting over IVR or web-chat, with full context preservation.

## Much more than just Call Steering

DiaManT® allows for true end-to-end conversations in natural language. In comparison to other vendors that only provide Call Steering with rigidly structured Directed Dialog, with DiaManT® customers can speak freely and there is no pre-determined flow or structure that they have to follow. With DiaManT® there is one single application that determines both the intent of the caller as well as the delivery of self-services, so customer conversations are completely unstructured, meaning that your customers will never hear things like “say main menu to go back” — they just speak, and DiaManT® listens, understands, and cares.




96. The Accused IVR Platform includes an “IVR system” that “converts the unit of speech input into a series of textual elements contained within event data messages, wherein the event data messages are associated with the call session by a unique Stream\_ID.” The Accused

<sup>24</sup> <https://omilia.com/technology/omni-channel-conversational-platform/> (annotated by counsel)

IVR Platform converts speech input into text. At least because the Accused IVR Platform saves or records historic call data and analyzes it for use in building models, the text will be contained in event data messages that are associated with individual call sessions that are each assigned a unique ID for ready identification and retrieval;<sup>25</sup> *see also* ¶ 53.

## omIVR features

omIVR executes the dialog call-flow and invokes the services of deepASR<sup>®</sup> for speech-to-text, and omTTS<sup>®</sup> for speech synthesis, through the industry standard MRCP protocol. It runs on both physical and virtual hardware, providing a highly scalable system to meet all your business and technical requirements.

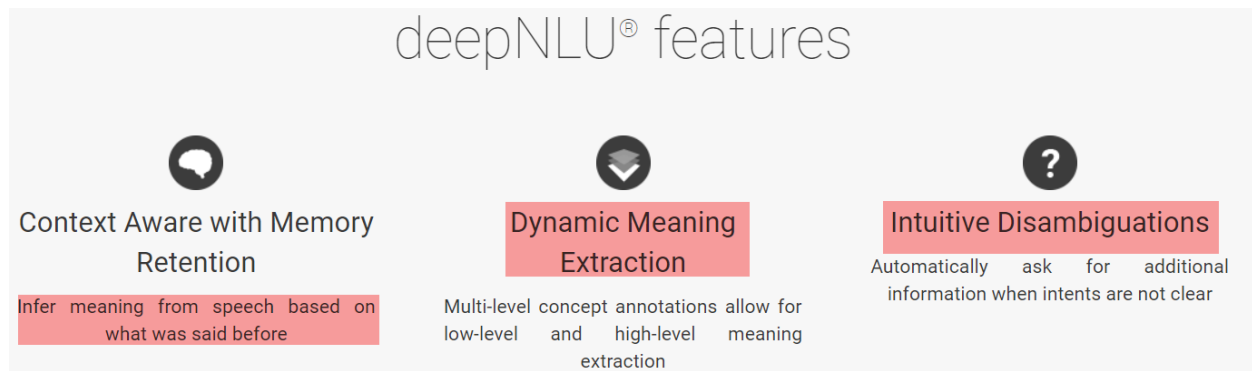
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|---|---|---|
|    |    |    |
| <p>The DRTviewer<sup>®</sup> is a web-based tool that provides real-time transparency to all customer interactions on DiaManT<sup>®</sup>, regardless of channel. Via the DRTviewer<sup>®</sup> tool, business users can monitor live sessions in real-time as well as search through historical dialogs.</p> | <p>Omilia offers a web-based automated reporting module that presents statistical data regarding the use of the application, making it easy to analyze user interactions and measure KPI's. omReports<sup>®</sup> present key metrics of the system's performance in an analytical way — making it possible to identify areas for increased automation.</p> | <p>Visualize the big data generated by DiaManT<sup>®</sup> to analyze customer conversations with the virtual agent as well as with live agents. omAnalytics<sup>®</sup> provides real-time business discovery on what customers are actually saying, with detailed Topic and Sentiment Analysis on natural language feedback from consumers.</p> |

97. The Accused IVR Platform includes “a complex events processor (CEP) configured to dynamically modify the execution of the plurality of interaction files by the IVR system for the call session based on an analysis of the event data messages.” Upon information and belief, at least because the Accused IVR Platform maintains a record of an entire conversation so that it can create a customized user interaction, the Accused IVR Platform is configured to dynamically modify which interaction files to execute based on an analysis of the event data messages associated with the particular conversation history.<sup>26</sup>

<sup>25</sup> <https://omilia.com/technology/omni-channel-conversational-platform/> (annotated by counsel).

<sup>26</sup> *Id.* (annotated by counsel).





98. The Accused IVR Platform includes a system “wherein said modification is contained within an action message sent by the CEP to the IVR system, wherein the action message is identified with the Stream\_ID corresponding to the analyzed the event data messages.” Upon information and belief, at least because the Accused IVR Platform is configured to provide self-services for a user and identify intent based on conversation history, the Accused IVR Platform executes action messages to perform a modified task or process once it identifies the user’s intent. As discussed above, at least because the Accused IVR Platform maintains historical call logs, upon information and belief actions messages from each call are identified through a unique ID from each call.

99. Omilia also induces the infringement of the ’804 Patent by its customers in the United States as discussed above under 35 U.S.C. § 271(b), both by configuring the Accused IVR Platform to operate in a manner that Omilia knows infringes the ’804 Patent and by encouraging its customers to use the Accused IVR Platform in a manner that Omilia knows infringes the ’804 Patent. Omilia has had knowledge of the ’804 Patent since at least October 9, 2018. According to Omilia’s website, through its “Certified Partner Program,” Omilia has worked with Concentrix Corporation/Convergys, Speech-Soft Solutions, LLC, and NICE inContact to make, use, offer to sell, or sell the Accused IVR Platform in the United States. *See* ¶ 41.

100. Omilia has also sold or offered to sell the Accused IVR Platform in an infringing configuration to its customers in the United States. *See* ¶ 42.

101. Omilia also contributes to the infringement of the '804 Patent by its customers in the United States as discussed above under 35 U.S.C. § 271(c). Omilia has had knowledge of the '804 Patent since at least October 9, 2018. The Accused IVR Platform is a material part of the system in at least Claim 1 of the '804 Patent, has no substantial non-infringing uses, is not a staple article of commerce, and is specifically made and adapted for use in an infringing manner, as discussed above.

102. Upon information and belief, Omilia has made and is continuing to make unlawful gains and profits from its infringement of the '804 Patent.

103. As detailed above, Omilia has continued its infringement despite having knowledge of the '804 Patent and Nuance's infringement claims.

104. Omilia's infringement has caused and will continue to cause irreparable harm to Nuance unless Omilia's infringing activities are preliminarily and permanently enjoined by this Court.

105. Omilia's infringement has also caused monetary damages to Nuance in an amount to be determined at trial.

**COUNT VI: INFRINGEMENT OF THE '532 PATENT**  
**UNDER 35 U.S.C. § 271**

106. Nuance incorporates by reference the allegations contained in the foregoing paragraphs as though fully stated herein.

107. Omilia and/or its customers directly infringe one or more claims of the '532 Patent under 35 U.S.C. § 271(a), including at least Claim 1, either literally or under the doctrine

of equivalents by making, using, offering to sell, selling, and/or importing the Accused IVR Platform in the United States without permission or license from Nuance.

108. By way of example only and not limitation, Claim 1 of the '532 Patent claims:

1. A method comprising:

receiving a voice utterance from a user;

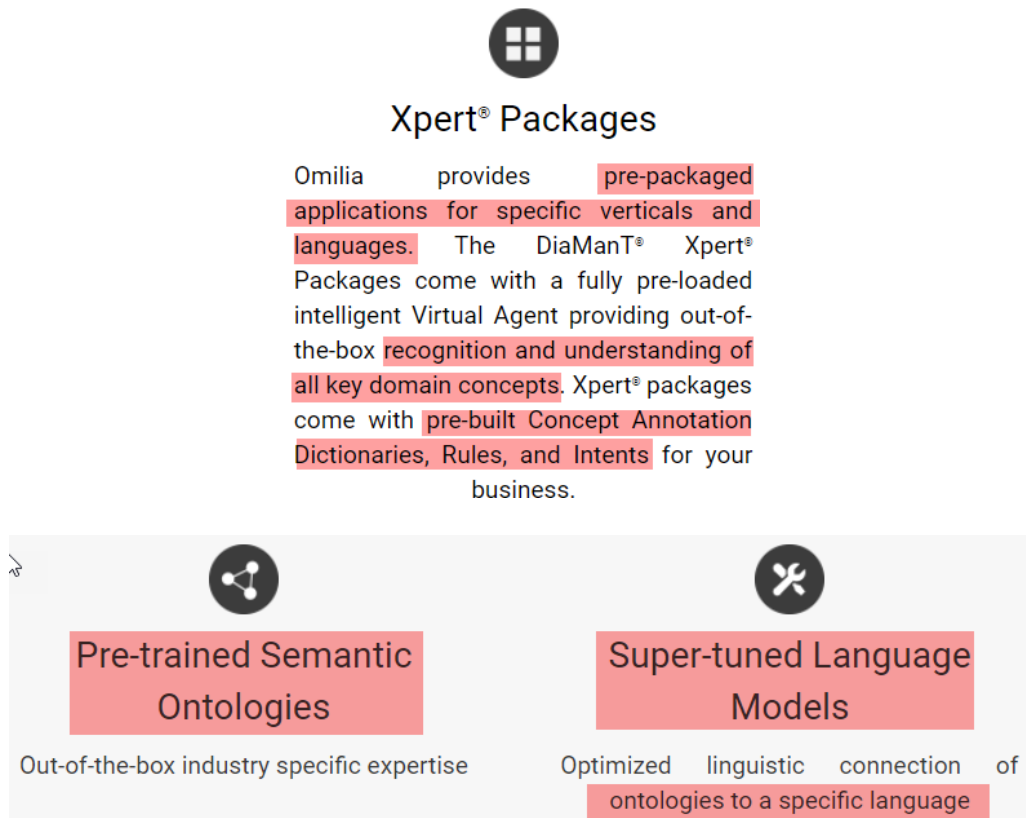
determining, using at least one speech engine operating on at least one processor and a plurality of grammars that each specifies a limited set of one or more acceptable inputs in a language of a plurality of languages, a plurality of speech recognition results for the voice utterance and a plurality of confidence levels, the at least one speech engine determining each of the plurality of speech recognition results by using at least one of the plurality of grammars and matching the voice utterance to the limited set of acceptable inputs identified by the at least one grammar of the plurality of grammars, each confidence level of the plurality of confidence levels corresponding to a respective speech recognition result of the plurality of speech recognition results and each of the plurality of speech recognition results corresponding to a respective language of the plurality of languages, wherein each of the plurality of confidence levels determined using the at least one speech engine indicates a confidence of the at least one speech engine that the voice utterance matches a matched input of the limited set of acceptable inputs identified by the at least one grammar used to determine the speech recognition result;

evaluating the plurality of confidence levels for the plurality of speech recognition results to determine a speech recognition result of the plurality of speech recognition results having a highest confidence level of the plurality of confidence levels determined by the at least one speech engine; and

selecting one of the plurality of languages for use in subsequently interacting with the user by selecting a language corresponding to the speech recognition result having the highest confidence level of the plurality of confidence levels determined by the at least one speech engine.

109. The Accused IVR Platform meets each element in at least Claim 1 of the '532 Patent. For example, Omilia and/or its customers utilizing the Accused IVR Platform perform a method for speech recognition with multiple language models based on a plurality of grammars or ontologies that each specifies a limited set of one or more acceptable inputs for the language. Omilia states that the Accused IVR Platform is capable of recognizing speech in multiple


languages based on pre-built concepts, dictionaries, rules, and intents for different dialects and accents:



The diagram features a central icon of a circle with four squares inside. Below it, the title "Xpert® Packages" is centered. The main text describes Omilia's offerings: pre-packaged applications for specific verticals and languages, a fully pre-loaded intelligent Virtual Agent, and out-of-the-box recognition and understanding of all key domain concepts. It also mentions pre-built Concept Annotation Dictionaries, Rules, and Intents. Below this text are two boxes. The left box, titled "Pre-trained Semantic Ontologies" with a network icon, describes "Out-of-the-box industry specific expertise". The right box, titled "Super-tuned Language Models" with a wrench icon, describes "Optimized linguistic connection of ontologies to a specific language".


**Xpert® Packages**

Omilia provides pre-packaged applications for specific verticals and languages. The DiaManT® Xpert® Packages come with a fully pre-loaded intelligent Virtual Agent providing out-of-the-box recognition and understanding of all key domain concepts. Xpert® packages come with pre-built Concept Annotation Dictionaries, Rules, and Intents for your business.



**Pre-trained Semantic Ontologies**

Out-of-the-box industry specific expertise



**Super-tuned Language Models**

Optimized linguistic connection of ontologies to a specific language

## deepASR® Languages

Today, our engine excels in recognizing 17 languages including English (US, Canada, UK, & South Africa), Spanish, Russian, Polish, Kazakh, Ukrainian and Greek.

Thanks to Omilia's proprietary method of training and tuning, deepASR® is able to achieve Word Error Rates of less than half of legacy incumbent providers.

For all primary languages Omilia offers adapted acoustic and language models that cover the accent and dialectic variations within the country.

## Why deepASR® succeeds where others fail?

Your customers do not speak one single language — in reality your customers have a very wide range of accents and ways of expressing themselves. In today's globalized economy there is no "one size fits all" for any language model. In the past strong accents, slang and ethnic vocabulary make companies nervous about new speech technologies. This reservation towards speech technologies stems from over-promised and under-delivered solutions from our competitors, that just didn't quite work outside their lab.

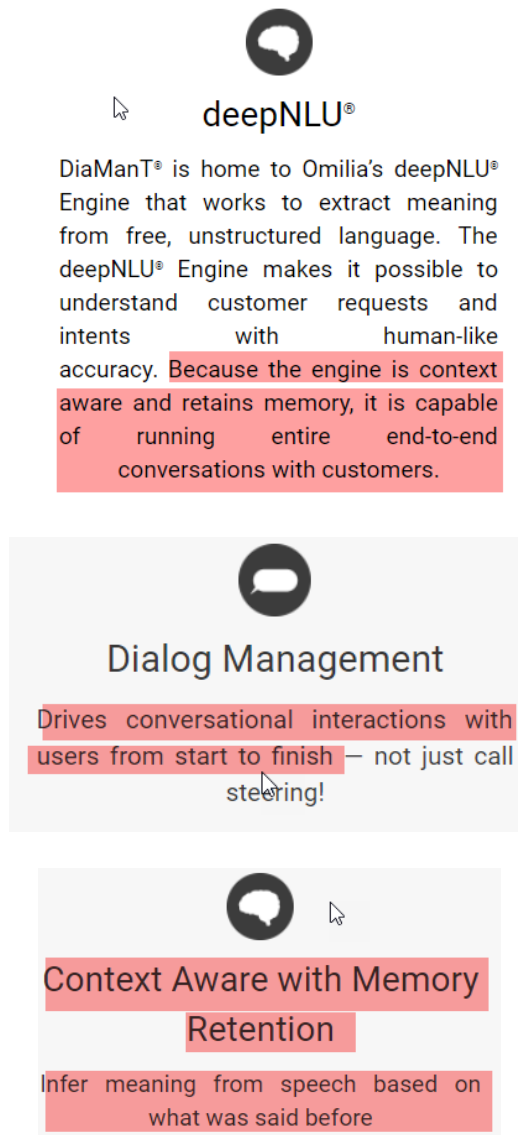
110. The Accused IVR Platform assigns a plurality of confidence levels to a plurality of speech recognition results. Upon information and belief, at least because it recognizes 17 languages, covers accent and dialectic variations within a country, and provides for speech recognition for customers that do not speak a single language, the Accused IVR Platform is configured to recognize and assign confidence levels to speech recognition results within a voice utterance.

111. The Accused IVR Platform is configured for “evaluating the plurality of confidence levels for the plurality of speech recognition results to determine a speech recognition result of the plurality of speech recognition results having a highest confidence level of the plurality of confidence levels determined by the at least one speech engine.” Upon information and belief, at least because the Accused IVR Platform is configured to assign confidence levels to multiple speech recognition results, and because it is ultimately capable of recognizing speech in multiple different languages, the Accused IVR Platform is configured to evaluate the confidence levels and determine which is the highest.

112. The Accused IVR Platform is configured to select “one of the plurality of languages for use in subsequently interacting with the user by selecting a language corresponding to the speech recognition result having the highest confidence level of the plurality of confidence levels determined by the at least one speech engine.” Omilia states that the Accused IVR Platform uses a “personalized approach to speech recognition” that is capable of storing memory and completing end-to-end interactions with a user:

In many cases the sound quality reaching the call center can be very poor due to many reasons — because most recognition engines are trained in a laboratory to understand perfect quality sound, they inevitably fail in the real world where sound quality is usually sub-par. Omilia has solved this problem by training our recognition models with real world call center audio to optimize the language and acoustic models of our ASR engine. With this personalized approach to speech recognition

Omilia reached unprecedented accuracy in speech to text transcription.



113. Upon information and belief, at least because the Accused IVR Platform retains memory and determines context and meaning for completing end-to-end interactions with a user based on prior utterances, the Accused IVR Platform is configured to choose a language based on the highest confidence level of an utterance and using that language for subsequent interactions with the user.

114. Omilia also induces the infringement of the '532 Patent by its customers in the United States as discussed above under 35 U.S.C. § 271(b), both by configuring the Accused IVR Platform to operate in a manner that Omilia knows infringes the '532 Patent and by

encouraging its customers to use the Accused IVR Platform in a manner that Omilia knows infringes the '532 Patent. Omilia has had knowledge of the '532 Patent since at least the filing of this Complaint. According to Omilia's website, through its "Certified Partner Program," Omilia has worked with Concentrix Corporation/Convergys, Speech-Soft Solutions, LLC, and NICE inContact to make, use, offer to sell, or sell the Accused IVR Platform in the United States. See ¶ 40.

115. Omilia has also sold or offered to sell the Accused IVR Platform in an infringing configuration to its customers in the United States. See ¶ 41.

116. Omilia also contributes to the infringement of the '532 Patent by its customers in the United States as discussed above under 35 U.S.C. § 271(c). Omilia has had knowledge of the '532 Patent at least as of filing of this Complaint. The Accused IVR Platform is a material part of the system in at least Claim 1 of the '532 Patent, has no substantial non-infringing uses, is not a staple article of commerce, and is specifically made and adapted for use in an infringing manner, as discussed above.

117. Upon information and belief, Omilia has made and is continuing to make unlawful gains and profits from its infringement of the '532 Patent.

118. Omilia's infringement has caused and will continue to cause irreparable harm to Nuance unless Omilia's infringing activities are preliminarily and permanently enjoined by this Court.

119. Omilia's infringement has also caused monetary damages to Nuance in an amount to be determined at trial.

**COUNT VII: INFRINGEMENT OF THE '688 PATENT**  
**UNDER 35 U.S.C. § 271**

120. Nuance incorporates by reference the allegations contained in the foregoing paragraphs as though fully stated herein.

121. Omilia and/or its customers directly infringe one or more claims of the '688 Patent under 35 U.S.C. § 271(a), including at least Claim 1, either literally or under the doctrine of equivalents by making, using, offering to sell, selling, and/or importing the Accused IVR Platform in the United States without permission or license from Nuance.

122. By way of example only and not limitation, Claim 1 of the '688 Patent claims:

1. A method for selecting context-dependent units for speech recognition comprising:

accepting a representation of the first word from a first language in terms of subword units from a first set of subword units that is associated with the first language, including accepting a first subword unit of the first word which is adjacent to the second word from a second language according to a speech recognition grammar;

determining a common set of features that characterize subword units in both the first set of subword units and in a second set of subword units that is associated with the second language; and

selecting one or more first context-dependent units corresponding to the first subword unit according to features in the common set of features of a second subword unit of the second word which is adjacent to the first word according to the grammar.

123. The Accused IVR Platform meets each element in at least Claim 1 of the '688 Patent. For example, Omilia and/or its customers utilizing the Accused IVR Platform perform a method for “selecting context-dependent units for speech recognition comprising accepting a representation of the first word from a first language in terms of subword units from a first set of subword units that is associated with the first language, including accepting a first subword unit



of the first word which is adjacent to the second word from a second language according to a speech recognition grammar.” Omilia states that the Accused IVR Platform recognizes speech from multiple languages based on the context and ontologies associated with such languages:

**Pre-trained Semantic Ontologies**  
Out-of-the-box industry specific expertise

**Super-tuned Language Models**  
Optimized linguistic connection of ontologies to a specific language

**Xpert® Packages**

Omilia provides pre-packaged applications for specific verticals and languages. The DiaManT® Xpert® Packages come with a fully pre-loaded intelligent Virtual Agent providing out-of-the-box recognition and understanding of all key domain concepts. Xpert® packages come with pre-built Concept Annotation Dictionaries, Rules, and Intents for your business.

**deepASR® Languages**

Today, our engine excels in recognizing 17 languages including English (US, Canada, UK, & South Africa), Spanish, Russian, Polish, Kazakh, Ukrainian and Greek.

Thanks to Omilia's proprietary method of training and tuning, deepASR® is able to achieve Word Error Rates of less than half of legacy incumbent providers.

For all primary languages Omilia offers adapted acoustic and language models that cover the accent and dialectic variations within the country.

124. Omilia further states that the Accused IVR Platform is configured to use a personalized approach to speech recognition for customers that speak multiple languages:

## Why deepASR® succeeds where others fail?

Your customers do not speak one single language — in reality your customers have a very wide range of accents and ways of expressing themselves. In today's globalized economy there is no “one size fits all” for any language model. In the past strong accents, slang and ethnic vocabulary make companies nervous about new speech technologies. This reservation towards speech technologies stems from over-promised and under-delivered solutions from our competitors, that just didn't quite work outside their lab.

In many cases the sound quality reaching the call center can be very poor due to many reasons — because most recognition engines are trained in a laboratory to understand perfect quality sound, they inevitably fail in the real world where sound quality is usually sub-par. Omilia has solved this problem by training our recognition models with real world call center audio to optimize the language and acoustic models of our ASR engine. With this personalized approach to speech recognition Omilia reached unprecedented accuracy in speech to text transcription.

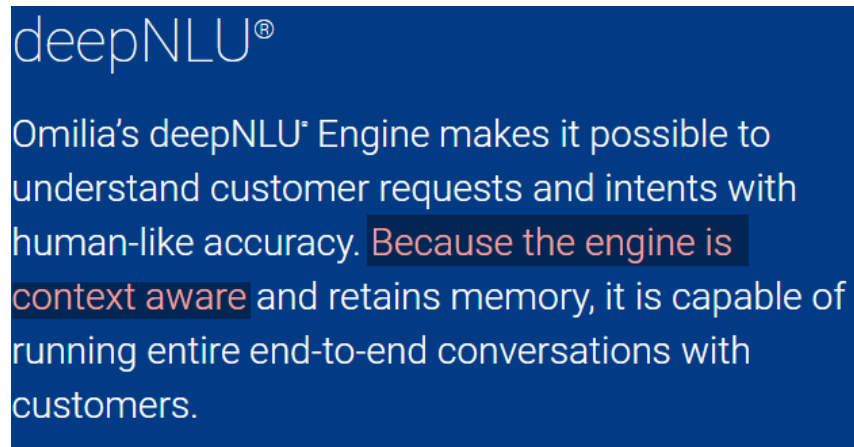
125. This specifically includes speech recognition for users that are speaking in slang or mixed languages:

This is why we specifically designed and developed our deepASR® technology to perform Natural Language Recognition with custom training on the exact sound quality and language (incl. slang & mixed languages) spoken by the actual customers reaching each particular enterprise's call center. deepASR® achieves unprecedented accuracy in language recognition at near zero error margins. Now you can have the confidence that your customers will have a fantastic experience every time they call!

126. Upon information and belief, at least because the Accused IVR Platform recognizes speech from a user that is using mixed languages and/or slang, it is capable of accepting a representation from a first word from a first language adjacent to a second word from a second language.

127. The Accused IVR Platform determines “a common set of features that characterize subword units in both the first set of subword units and in a second set of subword units that is associated with the second language.” Upon information and belief, at least because the Accused IVR Platform recognizes speech from an utterance that contains multiple languages, it determines common features that characterize subword units from a first language and subword units from a second language.

128. The Accused IVR Platform selects “one or more first context-dependent units corresponding to the first subword unit according to features in the common set of features of a second subword unit of the second word which is adjacent to the first word according to the grammar.” Omilia states that the Accused IVR Platform is context aware:



129. Upon information and belief, at least because the Accused IVR Platform is capable of recognizing speech from an utterance that contains multiple languages, and because it is context aware when it interacts with a user speaking multiple languages, it selects one or more first context-dependent units corresponding to the first subword unit according to features in the common set of features of a second subword unit of the second word which is adjacent to the first word according to the grammar.

130. Omilia also induces the infringement of the '688 Patent by its customers in the United States as discussed above under 35 U.S.C. § 271(b), both by configuring the Accused IVR Platform to operate in a manner that Omilia knows infringes the '688 Patent and by encouraging its customers to use the Accused IVR Platform in a manner that Omilia knows infringes the '688 Patent. Omilia has had knowledge of the '688 Patent since at least the filing of this Complaint. According to Omilia's website, through its "Certified Partner Program," Omilia has worked with Concentrix Corporation/Convergys, Speech-Soft Solutions, LLC, and

NICE inContact to make, use, offer to sell, or sell the Accused IVR Platform in the United States. See ¶ 40.

131. Omilia has also sold or offered to sell the Accused IVR Platform in an infringing configuration to its customers in the United States. See ¶ 41.

132. Omilia also contributes to the infringement of the '688 Patent by its customers in the United States as discussed above under 35 U.S.C. § 271(c). Omilia has had knowledge of the '688 Patent at least as of filing of this Complaint. The Accused IVR Platform is a material part of the system in at least Claim 1 of the '688 Patent, has no substantial non-infringing uses, is not a staple article of commerce, and is specifically made and adapted for use in an infringing manner, as discussed above.

133. Upon information and belief, Omilia has made and is continuing to make unlawful gains and profits from its infringement of the '688 Patent.

134. Omilia's infringement has caused and will continue to cause irreparable harm to Nuance unless Omilia's infringing activities are preliminarily and permanently enjoined by this Court.

135. Omilia's infringement has also caused monetary damages to Nuance in an amount to be determined at trial.

**COUNT VIII: INFRINGEMENT OF THE '925 PATENT**  
**UNDER 35 U.S.C. § 271**

136. Nuance incorporates by reference the allegations contained in the foregoing paragraphs as though fully stated herein.

137. Omilia and/or its customers directly infringe one or more claims of the '925 Patent under 35 U.S.C. § 271(a), including at least Claim 27, either literally or under the doctrine

of equivalents by making, using, offering to sell, selling, and/or importing the Accused IVR Platform in the United States without permission or license from Nuance.

138. By way of example only and not limitation, Claim 27 of the ‘925 Patent claims:

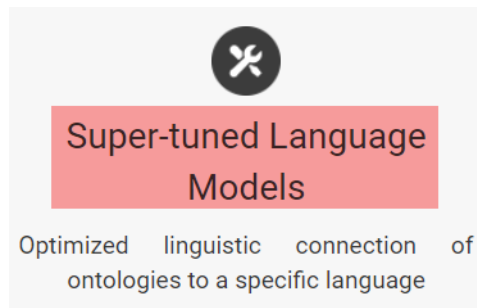
27. A computerized method of generating a second speech recognizer comprising the steps of:

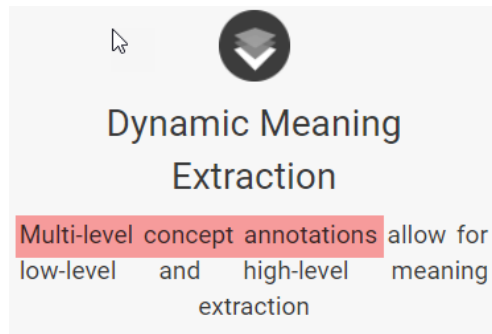
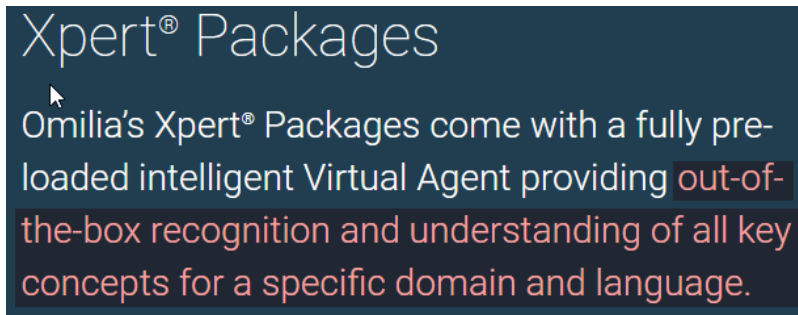
identifying a first speech recognizer of a first domain comprising a first acoustic model with a first decision network and corresponding first phonetic contexts;

receiving domain-specific training data of a second domain; and

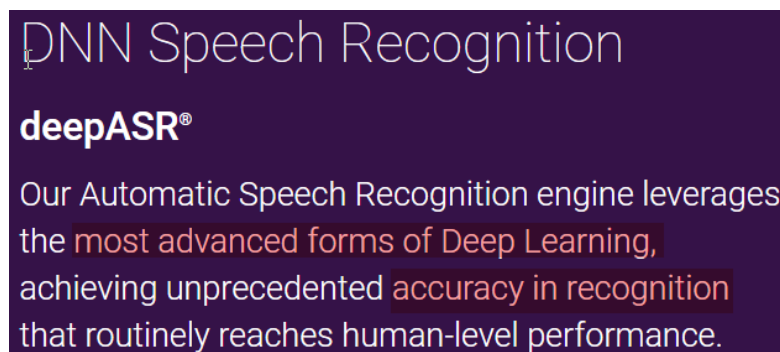
based on the first speech recognizer and the domain-specific training data, generating a second acoustic model of said first domain and said second domain comprising a second acoustic model with a second decision network and corresponding second phonetic contexts, wherein the first domain comprises at least a first language, wherein the second domain comprises at least a second language, and wherein the second speech recognizer is a multi-lingual speech recognizer.

139. The Accused IVR Platform meets each element in at least Claim 27 of the ‘925 Patent. For example, Omilia and/or its customers utilizing the Accused IVR Platform perform a method for “generating a second speech recognizer” by first “identifying a first speech recognizer of a first domain comprising a first acoustic model with a first decision network and corresponding first phonetic contexts.” Omilia states that the Accused IVR Platform includes a speech recognizer that can recognize speech from at least one language using acoustic models and a decision network based on phonetic contexts:





140. The Accused IVR Platform receives “domain-specific training data of a second domain.” Omilia states that the Accused IVR Platform employs “Deep Learning” and a “method of training and tuning” to “achieve Word Error Rates of less than half of legacy incumbent providers.”



Thanks to Omilia's proprietary method of training and tuning, deepASR® is able to achieve Word Error Rates of less than half of legacy incumbent providers.

141. According to Omilia, the Accused IVR Platform recognizes at least 17 languages:

## deepASR® Languages

Today, our engine excels in recognizing 17 languages including English (US, Canada, UK, & South Africa), Spanish, Russian, Polish, Kazakh, Ukrainian and Greek.

142. Upon information and belief, at least because the Accused IVR Platform trains and tunes its language models based on deep learning, and because it recognizes multiple languages, it is configured to receive training data that is specific to a second domain or language.

143. The Accused IVR Platform is configured to, “based on the first speech recognizer and the domain-specific training data, generating a second acoustic model of said first domain and said second domain comprising a second acoustic model with a second decision network and corresponding second phonetic contexts, wherein the first domain comprises at least a first language, wherein the second domain comprises at least a second language, and wherein the second speech recognizer is a multi-lingual speech recognizer.” Omilia states that the Accused IVR Platform recognizes speech from multiple languages using “adapted acoustic and language models,” including variations in domains such as slangs, accents, and dialects:

This is why we specifically designed and developed our deepASR® technology to perform Natural Language Recognition with custom training on the exact sound quality and language (incl. slang & mixed languages) spoken by the actual customers reaching each particular enterprise’s call center. deepASR® achieves unprecedented accuracy in language recognition at near zero error margins. Now you can have the confidence that your customers will have a fantastic experience every time they call!

## deepASR® Languages

Today, our engine excels in recognizing 17 languages including English (US, Canada, UK, & South Africa), Spanish, Russian, Polish, Kazakh, Ukrainian and Greek.

Thanks to Omilia's proprietary method of training and tuning, deepASR® is able to achieve Word Error Rates of less than half of legacy incumbent providers.

For all primary languages Omilia offers adapted acoustic and language models that cover the accent and dialectic variations within the country.

144. Upon information and belief, at least because the Accused IVR Platform recognizes speech in multiple languages, and because the multi-language models are adapted based on tuning and training, the Accused IVR Platform is configured to generate a second speech recognizer with a second acoustic model and second decision network and corresponding second phonetic contexts based on training data from at least two languages.

145. Omilia also induces the infringement of the '925 Patent by its customers in the United States as discussed above under 35 U.S.C. § 271(b), both by configuring the Accused IVR Platform to operate in a manner that Omilia knows infringes the '925 Patent and by encouraging its customers to use the Accused IVR Platform in a manner that Omilia knows infringes the '925 Patent. Omilia has had knowledge of the '925 Patent since at least the filing of this Complaint. According to Omilia's website, through its "Certified Partner Program," Omilia has worked with Concentrix Corporation/Convergys, Speech-Soft Solutions, LLC, and NICE inContact to make, use, offer to sell, or sell the Accused IVR Platform in the United States. See ¶ 40.

146. Omilia has also sold or offered to sell the Accused IVR Platform in an infringing configuration to its customers in the United States. See ¶ 41.

147. Omilia also contributes to the infringement of the '925 Patent by its customers in the United States as discussed above under 35 U.S.C. § 271(c). Omilia has had knowledge of the '925 Patent at least as of filing of this Complaint. The Accused IVR Platform is a material part of the system in at least Claim 1 of the '925 Patent, has no substantial non-infringing uses, is not a staple article of commerce, and is specifically made and adapted for use in an infringing manner, as discussed above.



148. Upon information and belief, Omilia has made and is continuing to make unlawful gains and profits from its infringement of the '925 Patent.

149. Omilia's infringement has caused and will continue to cause irreparable harm to Nuance unless Omilia's infringing activities are preliminarily and permanently enjoined by this Court.

150. Omilia's infringement has also caused monetary damages to Nuance in an amount to be determined at trial.

### **JURY DEMAND**

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, Nuance respectfully requests a trial by jury of any issues so triable.

### **PRAYER FOR RELIEF**

WHEREFORE, Nuance respectfully requests that:

- A. Omilia be adjudged by this Court to have directly, indirectly, and/or contributorily infringed one or more claims of each of the Asserted Patents under 35 U.S.C. § 271;
- B. Omilia be adjudged by this Court to have willfully infringed one or more claims of each of the Asserted Patents from the time Omilia became aware of the infringing nature of its conduct, and that Nuance be awarded treble damages for the period of such willful infringement pursuant to 35 U.S.C. § 284;
- C. The Court find the Asserted Patents valid and enforceable;
- D. Omilia be ordered by this Court to account for and pay Nuance damages adequate to compensate Nuance for the infringement of one or more claims of the Asserted Patents, pursuant to 35 U.S.C. § 284;

- E. This Court enter a preliminary and permanent injunction pursuant to 35 U.S.C. § 283 preventing continuing infringement of one or more claims of each of the Asserted Patents;
- F. This case be deemed exceptional and Nuance be awarded interests, costs, expenses, and reasonable attorneys' fees for this suit as provided by 35 U.S.C. § 285; and
- G. Nuance be awarded such other and further relief as this Court may deem just and proper.

Date: June 28, 2019

Respectfully submitted,

/s/ Jennifer Itzkoff

Jennifer Itzkoff (MA BBO No. 675694)

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